

Preliminary Amendment - Hirota  
Serial No. 09/541,779  
Page 2 of 2

pressure receiving part of the mechanism and a discharge pressure port connected to a compressor discharge pressure line;

a pressure responsive piston valve body loaded in an opening direction of the piston actuated valve closure part by a spring force;

wherein the piston actuated valve closure part includes a pressure receiving area loaded via an inhalation pressure port by the inhalation pressure of an inhalation pressure line of the compressor, and a solenoid for generating a thrust force for actuating the piston actuated valve closure part relative to the valve seat, the discharge pressure port and the inhalation pressure port being interconnected by a leakage passage;

wherein the piston actuated valve closure part is located at one side of the valve seat in the first valve chamber part connected to the differential pressure port, and is unitarily formed at one end of the piston valve body with the pressure receiving area loaded by the variable control pressure in the differential pressure port in a closing direction towards the valve seat;

wherein the piston actuated valve closure part is slidably provided within the second valve chamber part with the pressure receiving area loaded via the inhalation pressure port within the second valve chamber part by the inhalation pressure in the opening direction of the piston actuated valve closure part;

wherein the solenoid thrust acts upon the piston actuated valve closure part in the opening direction of the piston actuated valve closure part when the solenoid is supplied with current, the value of which determines the value of a differential pressure between the control pressure and the inhalation pressure at the differential pressure port; and

wherein the differential pressure port is connected to a control pressure cylinder part of a cylinder and increasing control pressure at the differential pressure port adjusts the compressor capacity towards a maximum.

11. (New) A capacity controller according to claim 10, wherein the fixed differential pressure is proportional to the value of the current supplied to the solenoid.

Preliminary Amendment – Hirota  
Serial No. 09/541,779  
Page 3 of 3

12. (New) A capacity controller according to claim 10, wherein an adjustment range of pressure variations of the variable control pressure at the differential pressure port is wider than a range of pressure variations at the inhalation pressure port.

13. (New) A capacity controller of a compressor with variable capacity comprising:  
a pressure controlled capacity variation mechanism connected to the solenoid actuated capacity controller generating a variable control pressure for the mechanism on the basis of an initial value of an inhalation pressure of the compressor;

wherein the capacity controller includes a valve seat situated between a first valve chamber part and a second valve chamber part and a piston actuated valve closure part to open or close communication between a differential pressure port connected to a control pressure receiving part of said mechanism and another port connected to a line of the compressor;

a pressure responsive piston valve body loaded in a closing direction of the piston actuated valve closure part by a spring force, the piston valve body having a pressure receiving area loaded via the inhalation pressure of an inhalation pressure line of the compressor in an opening direction of the piston actuated valve closure part relative to the valve seat;

wherein the differential pressure port and a discharge pressure line of the compressor are interconnected by a leakage passage;

wherein the piston actuated valve closure part and the valve piston body are located at a side of the valve seat in the second valve chamber part connected to the inhalation pressure port;

wherein the piston actuated valve closure part is unitarily formed at an end of the valve piston body with a pressure receiving area loaded by the variable control pressure in the differential pressure port in the opening direction relative to the valve seat;

wherein the solenoid thrust acts upon the valve piston body in the closing direction of the piston actuated valve closure part when the solenoid is supplied with a current, the value of which determines the value of a differential pressure between the control pressure

Preliminary Amendment – Hirota  
Serial No. 09/541,779  
Page 4 of 4

and the inhalation pressure at the differential pressure port; and

wherein the differential pressure port is connected to a control pressure cylinder part of a cylinder of the mechanism and increasing control pressure at the differential pressure port adjusts the compressor capacity towards a maximum.

14. (New) A capacity controller according to claim 13, wherein the fixed differential pressure is proportional to the value of the current supplied to the solenoid.

15. (New) A capacity controller according to claim 13, wherein an adjustment range of pressure variations of the variable control pressure at the differential pressure port is wider than a range of pressure variations at the inhalation pressure port.

16. (New) A method to control the capacity of a compressor having variable capacity by a pressure controlled capacity variation mechanism and a solenoid actuated capacity controller comprising the steps of:

generating a variable control pressure with the compressor for the mechanism corresponding to variations of an inhalation pressure of the compressor;

controlling an expanded variation range of a differential pressure between the control pressure actuating the mechanism and the inhalation pressure of the compressor by the value of a current supplied to the solenoid of the controller; and

maintaining an initial value of the differential pressure by adding pressure of a high pressure refrigerant of a discharge pressure line of the compressor via the controller to the control pressure and by permanently superimposing a predetermined pressure relieving throttling function between the mechanism and a low pressure inhalation line of the compressor.

17. (New) A method to control the capacity of a compressor having variable capacity by a pressure controlled capacity variation mechanism and a solenoid actuated

Preliminary Amendment – Hirota

Serial No. 09/541,779

Page 5 of 5

capacity controller comprising the steps of:

generating a variable control pressure with the compressor for the mechanism corresponding to variations of an inhalation pressure of the compressor;

controlling an expanded variation range of a differential pressure between the control pressure and the inhalation pressure by the value of a current supplied to the solenoid of the controller; and

maintaining an initial value of the differential pressure by relieving a part of the control pressure via the controller to a low pressure inhalation line of the compressor and by permanently superimposing a predetermined pressure adding throttling function between the mechanism and a high pressure refrigerant discharge line of the compressor.